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Nonylphenol affects activity of human reproductive cells

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Nonylphenol (NP) is an industrial compound belonging to Endocrine Disrupting Chemicals (EDCs) with xenoestrogenic activity abundantly present in the environment. Its xenoestrogenic activity was demonstrated both in vitro and in vivo. Estrogens play an important role in development and growth of human endometrium and prostate. Since NP mimics endogenous estrogens, it could have a negative influence on normal physiology of both organs. In this study we examined the effects of NP and 17-β-estradiol (E2) on human prostate adenocarcinoma epithelial cell line (LNCaP) and endometrial adenocarcinoma cell line Ishikawa. Firstly, we performed a MTT assay in order to see cell proliferation. We found that both NP and E2 stimulated prostate and endometrial cell proliferation but in different manner. In fact, on human prostate cells NP induced a non-monotonic increase of cell proliferation whereas on endometrial cells its effect was dose-dependent. Secondly, we studied expression and localization of estrogen receptor alpha (ERα) in both LNCaP and Ishikawa cells. Immunofluorescence and western blot analyses revealed that both NP and E2 induced cytoplasm-nucleus translocation of ERα even if E2 was able to induce an early nuclear translocation respect to NP. Finally through qPCR analysis we studied changing in gene expression of genes involved in proliferation pathways. We observed that in prostate cells NP and E2 induced upregulation of cyclin D1, ki-67, cytochine IL-8 and IL-1β together with a downregulation of cyclin E. On the contrary, in human endometrial cells gene upregulation was present only after E2 treatment whereas NP seem have no effects on these specific gene targets. These results showed that NP has estrogenic activity on human reproductive cells both in male and female system, but probably it may also interfere with other molecular pathways to induce a deregulation of normal cell physiology as seen in human endometrial cells.

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